

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Attorney's Docket No. SHORE-002

In re Application of:
Haase, Richard)
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Art Unit: 1724

Serial No.: 09/733,392 & 90/005,710

Filed: 12-7-00 & 4-24-00

Examiner: Barry, Chester T

Title: Method for Dewatering of Sludge

Declaration of Audrey L. Haase

My name is Audrey Haase. I am of sound mind, capable of making this Declaration and have personal knowledge of the facts stated herein.

1. I am employed by ClearValue Inc. as Vice President of Distribution - Coordinate all shipments and manufacturing operations. Additional duties include the management of client accounts in Arkansas and North East Texas and Accounting.
2. I have knowledge and experience in the application of polyelectrolytes, including polyDADMAC, polyEpi-DMA, polyacrylamides, metal salts and polynuclear aluminum compounds.
3. Prior to, during and after the time frame of 1997 I visited the wastewater plants of College Station and Texarkana Texas.
4. During the fall and winter of 1996 College Station Texas was having dewatering and economic performance difficulties with thermophillic bio-solids dewatering. I performed one plant demonstration during November of 1996 with Richard Haase at College Station wherein dewatering of the ATAD thermophillic digested bio-solids was performed with a 20 percent active DADMAC in combination with a cationic polyacrylamide, as compared to previous operation with only a Nalco cationic polyacrylamide.
5. This demonstration obtained a near 250% increase in centrifuge throughput and increased the dry cake solids from near 10% to near 15%, while

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reducing centrate solids from near 4% to near 1%.

6. In the winter of 1996, I was the representative for the wastewater treatment plant in Texarkana, Texas.
7. I was informed by City officials that Texarkana had in the last weeks increased their digestion temperature from near 95 °F to near 115 °F having an operating goal of 120 °F to obtain the pathogen degradation associated with thermophillic digestion.
8. I additionally witness that the performance of the belt press dewatering operation to be very poor as the floc was so loose that it did not even stay on the belts, thereby producing a significant mess in the dewatering area.
9. ClearValue recommended that the City of Texarkana dewater the new thermophillic bio-solids with a combination of CV 3650 (DADMAC) and CV 5240II (cationic polyacrylamide emulsion), the combinations of chemicals taught in US Patent 5,846,435.
10. This recommendation proved very successful, thereby improving belt press throughput and dewatered percent solids beyond the previous performance available when dewatering mesophillic digested bio-solids.
11. I have been informed that Ciba (Allied Colloids at that time), Polydyne and Callaway Specialty Chemicals, along with a few of their distributors attempted laboratory and belt press testing of their products to qualify for the bid on Texarkana the belt press dewatering and secondary TSS polymer as late as in the fall of 1997.
12. I have also been informed that none of the products tested by any of said suppliers provided a product to qualify to dewater the thermophillic bio-solids.
13. I believe that after witnessing the use of the chemical compounds provided by ClearValue to Texarkana that in the spring of 1998 Allied Colloids and Polydyne were able to provide an emulsion polymer system which met both laboratory and plant performance requirements to dewater thermophillic digested bio-solids.
14. It is my understanding that Ciba (Allied Colloids) and SNF, Inc., along with their associated distributors are known to provide polyquaternary

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amines in the dewatering of thermophilic bio-solids and bio-solids from a thermophilic digestion process to the following cities: College Station, Texas; Texarkana, Texas; Houston, Texas (Gulf Coast Waste Disposal Authority); Los Angeles, CA (The Hyperion Plant); Tampa, FL; Birmingham, AL and Jackson, MS.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issued thereon.

Full name of Declarant: *Audrey Lois Haase*

Residence: *4402 Ringrose Dr. Missouri City, TX 77459*

Citizenship: USA

Post Office Address: N/A

Date: *9/12/03*

Audrey Lois Haase
Signature of Declarant

Declaration of Audrey Haase

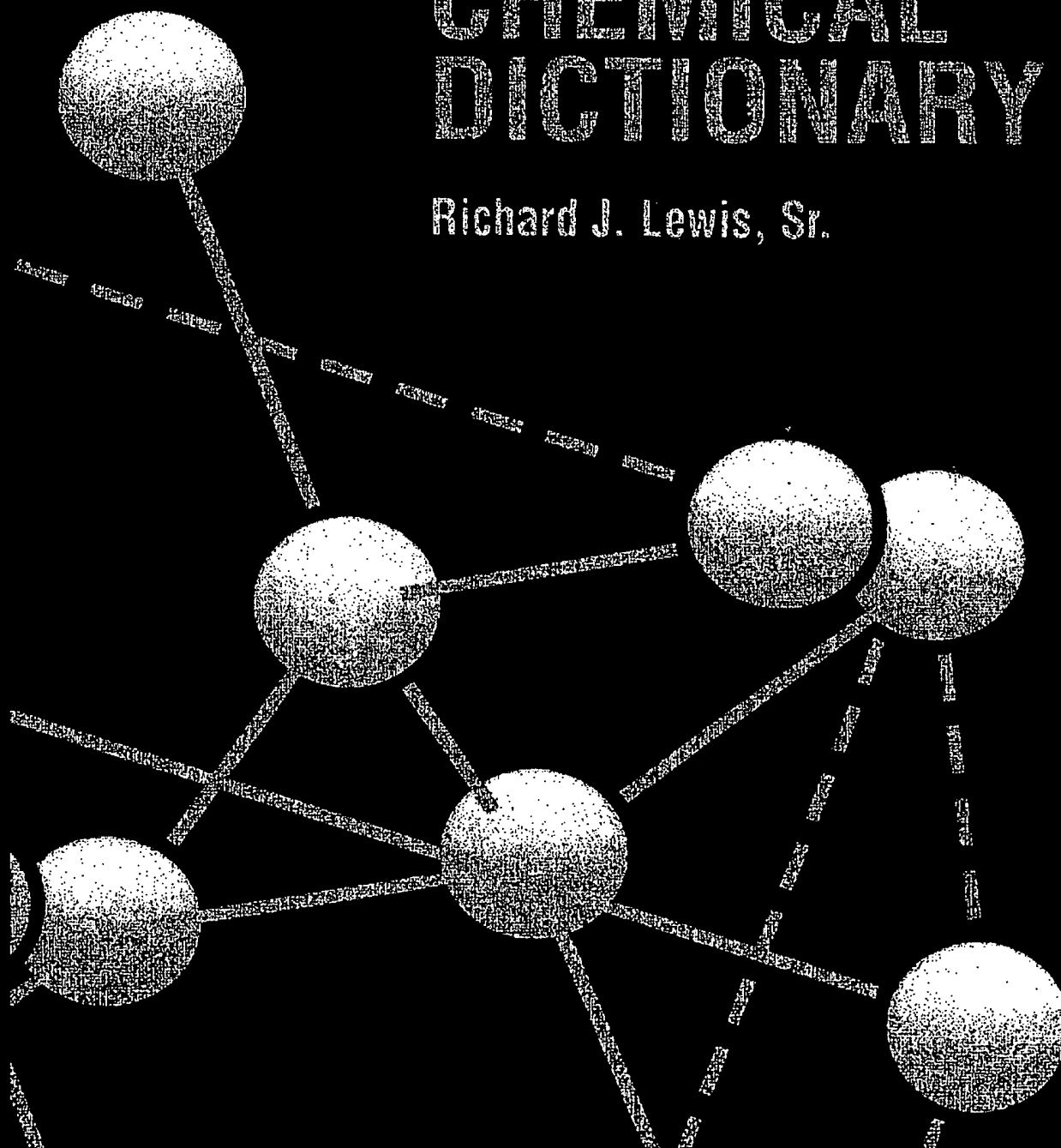
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Twelfth Edition

Hawley's CONDENSED CHEMICAL DICTIONARY

Richard J. Lewis, Sr.



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Library of Congress Catalog Card Number 92-18951
ISBN 0-442-01131-8

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Printed in the United States of America

Van Nostrand Reinhold
115 Fifth Avenue
New York, NY 10003

International Thomson Publishing GmbH
Konigswinterer Str. 518
5300 Bonn 3
Germany

International Thomson Publishing
Berkshire House, 168-173
High Holborn, London WC1V 7AA
England

International Thomson Publishing Asia
38 Kim Tian Rd., #0105
Kim Tian Plaza
Singapore 0316

Thomas Nelson Australia
102 Dodds Street
South Melbourne 3205
Victoria, Australia

International Thomson Publishing Japan
Kyowa Building, 3F
2-2-1 Hirakawacho
Chiyoda-Ku, Tokyo 102
Japan

Nelson Canada
1120 Birchmount Road
Scarborough, Ontario
M1K 5G4, Canada

16 15 14 13 12 11 10 9 8 7 6 5 4

Library of Congress Cataloging-in-Publication Data

Condensed chemical dictionary.

Hawley's condensed chemical dictionary.—12th ed./revised by
Richard J. Lewis, Sr.

p. cm.

ISBN 0-442-01131-8

I. Chemistry—Dictionaries. I. Hawley, Gessner Goodrich, 1905-1983

II. Lewis, Richard J., Sr. III. Title.

QD5.C5 1992

540'.3—dc20

92-18951

CIP

QUARTZ, FUSED

986

Derivation: Synthetic crystals of good size and purity are grown by mass production methods under very carefully regulated conditions of temperature and concentration.

Hazard: Avoid inhalation of fine particles. TLV: (for respirable dust) 10 mg/m³/‰ respirable quartz + 2.

Use: Electronic components, piezoelectric control in filters, oscillators, frequency standards, wave filters, radio and TV components; barrel-finishing abrasive.

See also silica.

quartz, fused. Pure silica that has been melted to yield a glass-like material on cooling.

Use: For apparatus and equipment (such as vacuum tubes) where its high melting point, ability to withstand large and rapid temperature changes, chemical inertness and transparency (including UV radiation), and electrical resistance are valuable. Produced as fibers and fabrics for heat resistance, low expansion coefficient, and insulating value.

See also glass.

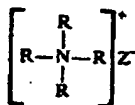
quassia. (bitter ash; bitterwood).

Derivation: The wood or bark of *Picrasma excelsa* or *Quassia amara*.

Properties: Very bitter taste, white to bright yellow chips or shavings.

Use: Decoction or tincture as a fly poison, surrogate for hops, medicine (anthelmintic), hair lotion, flavoring, alcohol denaturant.

quaternary ammonium salt. A type of organic nitrogen compound in which the molecular structure includes a central nitrogen atom joined to four organic groups (the cation) and a negatively charged acid radical (the anion). The structure is indicated as:



Octadecyldimethylbenzyl ammonium chloride and hexamethonium chloride are examples. Pentavalent nitrogen ring compounds, such as lauryl pyridinium chloride, are also considered quaternary ammonium compounds. They are all cationic surface-active coordination compounds and tend to be adsorbed on surfaces.

Use: Disinfectant, cleanser and sterilizer, cosmetics (deodorants, dandruff removers, emulsion stabilizers), fungicides, mildew control, to increase affinity of dyes for film in photography, coating of pigment particles to improve dispersibility, to increase adhesion of road dressings and paints, antistatic additive, biocide.

See also detergent, synthetic, coordination compound.

p-quaterphenyl. $C_6H_5C_6H_4C_6H_4C_6H_5$.

Properties: Crystals, mp 316-318°C, bp 428°C (18 mm Hg).

Grade: Purified.

Use: As primary fluor or as wavelength shifter in soluble scintillators.

quebrachine. See yohimbine.

quebracho.

Properties: A wood-derived tannin, the most important tanning agent used in the American leather industry. Combustible.

Derivation: From *Aspidosperma quebracho* and *Quebracho lorentzi*, imported as logs from Argentina.

Grade: Liquid: 35-37% tannin. Solid: 65% tannin.

Use: Vegetable tanning, retanning of chrome-tanned upper leathers, dyeing, ore flotation, oil well drilling fluids, flavoring.

Quelet reaction. Passage of dry hydrogen chloride through a solution in ligroin of a phenolic ether and an aliphatic aldehyde in the presence or absence of a dehydration catalyst to yield α -chloroalkyl derivatives by substitution in the para position to the ether group or in the ortho position in para-substituted phenolic ethers.

quench. In the terminology of metallurgy, quick cooling of metals or alloys by immersion in cold water or oil. This is an essential part of the tempering process, especially for steels. If the metal or alloy is in the liquid (molten) state, and the quench time is extremely short (less than a second), the product will have an amorphous or glass-like structure, because no crystallization occurs.

See also glass, metallic.

quercetin. CAS: 117-39-5. $C_{15}H_{10}O_7$.

Properties: Yellow needles (dihydrate), anhydrous form decomposes at 315°C, soluble in alcohol and glacial acetic acid, insoluble in water.

Derivation: Bark of fir trees, also synthetically.

Use: Medicine, reported formation of epoxy resins on mixing with epichlorohydrin.

"Questex" [Stauffer]. TM for ethylenediaminetetraacetic acid (EDTA) and derivatives, a group of polyamino-acid-based organic sequestering agents that complex or chelate multivalent, metallic cations (such as calcium, magnesium, copper, and iron) into stable, coordinated anionic complexes.

quick-. Prefix meaning alive or active, as in quicksilver (mercury), quicklime (unslaked

are based on vegetable waxes (carnauba and candelilla), combined with softeners, fillers, and pigments or emulsified in alcohol or other solvent. Furniture polishes often contain red oil, lemon oil, and petroleum solvent; most types of metal and wood polish contain organic solvents, and, hence, are flammable liquids. Nail polishes are nitrocellulose lacquers, usually with amyl acetate solvent.

See also electro-polishing.

Hazard: May be flammable.

(2) The hard outer coating of cereal grains, especially rice, which is usually removed in processing. These coatings are rich in vitamin B₁. Their removal robs the cereal of much of its nutritive value.

pollucite. $\text{Cs}_2\text{Al}_2\text{Si}_2\text{O}_6 \cdot \text{H}_2\text{O}$. A natural cesium aluminum silicate found in pegmatites.

Properties: Colorless, Mohs hardness 6.5, d 2.9.

Use: Source of cesium, catalyst, fluxes, welding materials, ion propulsion, thermocouple units.

pollution. Introduction into any environment of substances that are not normally present therein and that are potentially toxic or otherwise objectionable. The most serious atmospheric contaminants have been (1) sulfur dioxide evolved from the fuels used in electric power production and industrial processing, and (2) automobile exhaust gases rich in carbon monoxide and tetraethyllead residues. The former is being alleviated by mandatory use of low-sulfur fuels and the latter by elimination of tetraethyllead from most gasoline and by use of catalytic converters.

Water pollution caused by discharge of toxic chemical wastes is closely regulated by both the EPA and the FDA. Such substances are defined in the 1972 amendment of the Federal Water Pollution Control Act as those "which will cause death, disease, cancer, or genetic malfunctions in any organisms with which they come into contact." Substances added to water for purification purposes (chlorine, aluminum sulfate, etc.) are excluded from the category of pollutants.

See also Environmental Protection Agency, air pollution, water pollution.

polonium. Po. Radioactive element of atomic number 84, member of group VIA of the periodic table, aw 210, valences = 2, 4, 6. There are no stable isotopes. Polonium is a member of the uranium natural radioactive-decay series, occurring naturally in uranium-bearing ores; it is produced artificially by bombarding bismuth with neutrons. It has been identified in cigarette smoke. Properties: Similar to those of tellurium, mp 254°C, bp 962°C, d 9.4, dissolved by concentrated sulfuric and nitric acids and aqua regia and by dilute hydrochloric acid.

Hazard: Dangerous radioactive poison.

Use: Source of α -radiation and neutrons, instrument calibration, oil-well logging, moisture determination, power source.

See smoke (4).

Polonovski reaction. Demethylation of tertiary (or heterocyclic) amine N-oxides on treatment with acetyl chloride or acetic anhydride to give N-acylated secondary amines and formaldehyde, along with O-acylated aminophenols as a result of a side reaction.

poly-. A prefix signifying many. For example, a polymer is an aggregate formed by combination of a number of single molecules.

See polymer, high.

"Polyac" [Du Pont]. TM for a butyl rubber conditioner containing 25% poly-p-dinitrosobenzene $[\text{C}_6\text{H}_4(\text{NO}_2)_2]_n$ with an inert wax. Dark brown, waxy pellets; d 0.96.

Use: Processing aid and accelerator of vulcanization for butyl rubber.

polyacetal. See acetal resin.

polyacetylene. A linear polymer of acetylene having alternate single and double bonds, developed in 1978. It is electrically conductive, but this property can be varied in either direction by appropriate doping either with electron acceptors (arsenic pentafluoride or a halogen) or with electron donors (lithium, sodium). Thus, it can be made to have a wide range of conductivity from insulators to n- or p-type semiconductors, to strongly conductive forms. Polyacetylene can be made in both *cis* and *trans* modifications in the form of fibers and thin films, the conductivity of the fibers increasing with their degree of orientation. Films can be applied on glass or metal substrates. Though still in an experimental stage, these polymers have significant possibilities for industrial applications, e.g., in batteries. See also cyclooctatetraene.

polyacrylamide. $(\text{CH}_2\text{CHCONH}_2)_n$. White solid, water-soluble high polymer.

Derivation: Polymerization of acrylamide with N,N'-methylene bisacrylamide.

Use: Thickening agent, suspending agent, additive to adhesives. Permissible food additive.

See also acrylic resin.

polyacrylate. See acrylic resin.

polyacrylic acid. See acrylic acid; methacrylic acid.

polyacrylonitrile. A polymer of acrylonitrile which is the basic material used in the manufac-